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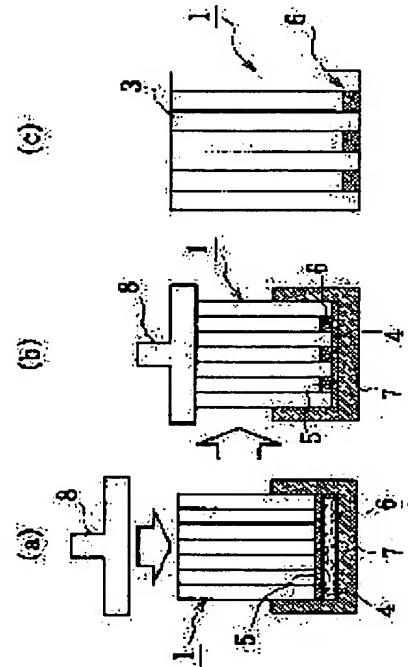
(21)Application number : 2000-116654 (71)Applicant : NGK INSULATORS LTD
 (22)Date of filing : 18.04.2000 (72)Inventor : FUKUDA TAKESHI
 ENOMOTO AKIO
 ITO EIJI

(54) METHOD FOR PREPARING CERAMIC BODY

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a method for preparing a ceramic body wherein openings of cells on the end faces can be simply sealed and which can easily cope with automation.

SOLUTION: In the method for preparing the ceramic body wherein a ceramic body with a structure wherein cells 3 are alternately sealed on both end faces of a ceramic honeycomb structural body is obtained by filling a slurry 6 for sealing into specified cells 3 on both end faces of a ceramic honeycomb molded body 1 and then, calcining it, a hole 5 is made at a position corresponding to the specified cell 3 of a sheet 4 stuck on the end face of the ceramic honeycomb molded body 1 to form a mask corresponding to every honeycomb molded body 1 and the face stuck with a mask is immersed in the slurry 6 for sealing to fill the slurry 6 for sealing into the cell 3 from the hole 5 made in the mask.



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CLAIMS

[Claim(s)]

[Claim 1] In the manufacture approach of the ceramic object calcinated and acquired after filling up with the slurry for the closures a predetermined cel [in / for the ceramic object of the structure where the closure of the cel was carried out by turns in respect of the both ends of a ceramic honeycomb structure object / the both-ends side of a ceramic honeycomb Plastic solid] The mask which ended the hole in the location corresponding to the predetermined cel of the sheet stuck on the end face of a ceramic honeycomb Plastic solid, and corresponded to it for every honeycomb Plastic solid is created. The manufacture approach of the ceramic object characterized by being filled up with the slurry for the closures into a cel from the hole which was immersed in the slurry for the closures in the field on which the mask was stuck, and broke on the mask.

[Claim 2] The manufacture approach of a ceramic object according to claim 1 of dividing the cel of an end face into two or more small blocks, and carrying out hole down to the sheet stuck on the end face of said ceramic honeycomb Plastic solid for every small block.

[Claim 3] The manufacture approach of a ceramic object according to claim 1 of carrying out hole down to the sheet stuck on the end face of said ceramic honeycomb Plastic solid using laser.

[Claim 4] The manufacture approach of a ceramic object according to claim 1 that the path of the hole which broke on said sheet is 30 - 70% of each cel area.

[Claim 5] The manufacture approach of a ceramic object according to claim 1 of recognizing said cel location by the image processing.

[Claim 6] The manufacture approach of a ceramic object according to claim 1 of carrying out hole down to the sheet stuck on the end face of said ceramic honeycomb Plastic solid using the Mt. Tsurugi-like needle set by the cel pitch of one needle or a ceramic honeycomb Plastic solid.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the manufacture approach of the ceramic object for acquiring the ceramic object of the structure where the closure of the cel was carried out by turns in respect of the both ends of a ceramic honeycomb structure object.

[0002]

[Description of the Prior Art] In order to acquire the ceramic object of the structure where the closure of the cel was carried out by turns in respect of the both ends of a ceramic honeycomb structure object from the former, the various manufacture approaches are learned. Drawing 5 (a) - (c) is drawing for explaining an example of the manufacture approach of such a conventional ceramic object. Drawing 5 (a) First, if an example of the manufacture approach of the conventional ceramic object is explained according to - (c), as shown in drawing 5 (a), only the part of the cel 52 to carry out eye closure in the end face of ceramic honeycomb Plastic solid (ceramic honeycomb structure object before baking) 51 will prepare the mask 54 made of rubber which ended the hole 53, and will set a mask 54 to the position in the end face of ceramic honeycomb Plastic solid 51 with a help.

[0003] Next, as shown in drawing 5 (b), the end face of ceramic honeycomb Plastic solid 51 which formed the mask 54 is immersed into the slurry 55 for the eye closures, and press fit restoration of the slurry 55 is carried out into a cel 52 through the hole 53 of a mask 54 by pressurizing a honeycomb Plastic solid from a top. About the other end side of ceramic honeycomb Plastic solid 51, the predetermined cel 52 is similarly filled up with a slurry 55. In order to acquire the structure where the closure of the cel 52 was carried out by turns in respect of both ends, in that case, the mask which has the opposite hole pattern with which the closure of the part of the hole 53 of the mask 54 mentioned above as a mask is carried out, and parts other than hole 53 serve as a hole is used. At the above process, as the cross section is shown in drawing 5 (c), ceramic honeycomb Plastic solid 51 of the structure where the closure of the cel 52 was carried out by the slurry 55 for the eye closures by turns in respect of the both ends of ceramic honeycomb Plastic solid 51 is acquired. The ceramic object made into the purpose can be acquired by calcinating acquired ceramic honeycomb Plastic solid 51 at the end.

[0004]

[Problem(s) to be Solved by the Invention] However, by the manufacture approach of the conventional ceramic object mentioned above, there was a problem that it was difficult for a position to produce the mask 54 which has a hole 53, and to set a mask 54 correctly at the end face of ceramic honeycomb Plastic solid 51. Especially, with the large-scale ceramic object with a high diameter [of a request] of about 300mm, the number of the cels 52 of an end face also reached tens of thousands cels, and made difficult the problem further mentioned above in recent years. Moreover, since the mask 54 was set to the end face of ceramic honeycomb Plastic solid 51 with the help, while skill of an operator was required and taking time amount, there was a problem which cannot respond to automation. Furthermore, the mask 54 needed cleaning of a mask 54 after activity termination, in order to reuse, but as mentioned above, since the mask 54 had the huge number of cels, it also had the problem from which cleaning of a mask 54 becomes serious.

[0005] The purpose of this invention cancels the technical problem mentioned above, can do the eye closure of the cel in an end face simply, and, moreover, tends to offer the manufacture approach of the ceramic object which is easy to respond also to automation.

[0006]

[Means for Solving the Problem] The manufacture approach of the ceramic object of this invention the ceramic object of the structure where the closure of the cel was carried out by turns in respect of the both ends of a ceramic honeycomb structure object In the manufacture approach of the ceramic object calcinated and acquired after filling up the predetermined cel in the both-ends side of a ceramic honeycomb Plastic solid with the slurry for the closures The mask which ended the hole in the location corresponding to the predetermined cel of the sheet stuck on the end face of a ceramic honeycomb Plastic solid, and corresponded to it for every honeycomb Plastic solid is created. The field on which the mask was stuck is immersed in the slurry for the closures, and it is characterized by being filled up with the slurry for the closures into a cel from the hole which broke on the mask.

[0007] In this invention, since the predetermined hole is used breaking whenever it carries out an eye closure process without a mask using a disposable sheet, production of a mask and the set to the ceramic honeycomb structure object of a mask can be lost. Moreover, recognition of a cel location and hole dawn to a sheet can be carried out by the image processing and laser beam machining as an example, and can respond also to automation.

[0008] As a desirable mode of this invention, the cel of an end face is divided into two or more small blocks, and hole dawn to the sheet stuck on the end face of a ceramic honeycomb Plastic solid is carried out for every small block. For dryness, change of an ingredient lot and a process condition, or variation, if hole dawn is performed in the cel pitch as a design value on the basis of a typical number cel to the end face of a ceramic honeycomb Plastic solid with a large-sized diameter of 300mm, according to distortion or deformation, a cel pitch will deform and the error of one or more cels will occur to a hole dawn location, so that a honeycomb Plastic solid becomes large. Moreover, if hole dawn is performed recognizing all cels at once, aiming at the core of a cel to all cel locations, and carrying out location amendment each time, even if it combines the computer for an image processing technique, laser beam machining, and data processing, a data transfer and location amendment at each time take time amount too much, and it is not object-like for facts. Since it fits in the error of less than one cel and the count of location amendment can also be reduced even if it will break a hole in the cel pitch as a design value to the criteria location of a small block since there is little deformation of the cel configuration in the field and a cel pitch if it is a small block, there is effectiveness also in time amount compaction. Moreover, the path of the hole which broke on the sheet is made into 30 - 70% of each cel area as a desirable mode. Even if fluctuation of some cel pitches is in a small block in this example, since the bore diameter is small, there is no fear of breaking a hole ranging over a cell wall or the next cel to a cel.

[0009]

[Embodiment of the Invention] Drawing 1 - drawing 4 are drawings for explaining an example of the manufacture approach of the ceramic object of this invention in order of a process, respectively. If the manufacture approach of the ceramic object of this invention is explained according to drawing 1 - drawing 4, ceramic honeycomb Plastic solid 1 (ceramic honeycomb structure object before baking) will be prepared first. The ceramic honeycomb Plastic solid which consists of cordierite known from the former as ceramic honeycomb Plastic solid 1 can be used suitably. Ceramic honeycomb Plastic solid 1 is producible as usual by extruding a raw material from mixed posterior orifice gold.

[0010] Next, as shown in drawing 1, the end side of prepared ceramic honeycomb Plastic solid 1 is picturized with a camera 2, and the location of all the cels 3 in an end face is recognized by carrying out the image processing of the picturized image. Next, as shown in drawing 2 (a), the sheet 4 of the almost same configuration as the end face of ceramic honeycomb Plastic solid 1 is prepared, and a sheet 4 is stuck on the whole field which has recognized the cel location as shown in drawing 2 (b). A commercial pressure sensitive adhesive sheet can be used as a sheet 4.

[0011] Next, as shown in drawing 3 (a) and (b), based on the cel location recognized by the image processing, the location used as the criteria of the small block set up for many specifications of every, such as an outer diameter, a cel pitch, etc. of a honeycomb Plastic solid, is calculated, the XYZtheta stage on which the honeycomb Plastic solid was put is positioned, and a hole 5 is broken in the cel location which carries out [sheet / 4] opening by approaches, such as laser beam machining. The sheet 4 which ended the hole 5 carries out the duty of a mask. 30 - 70% of the area of a cel 3 of the bore diameter of a hole 5 is desirable, and it is still more desirable. [about 50% of] Moreover, the configuration of a hole 5 is circular and does not need to end the whole cel area a cel 3 and in the shape of isomorphism (square). For this reason, to a cel 3, even if there is

fluctuation of some cel pitches in an end face, since the bore diameter is small, there is no fear of breaking a hole ranging over a cell wall or the next cel. In addition, according to the viscosity of the slurry used for the eye closure, when viscosity is low, the bore diameter of a hole 5 is more greatly chosen suitably more smallish, when viscosity is high. Moreover, although hole dawn processing to the sheet 4 mentioned above can also be performed at once to the whole end face, it is desirable to divide the cel 3 of an end face into two or more small blocks, and to carry it out for every small block. If hole dawn processing is carried out for every small block, since there is little deformation of the cel configuration in the field and a cel pitch, hole dawn can be performed correctly.

[0012] Next, as shown in - (c), it is filled up with the slurry 6 for the eye closures in the drawing 4 (a) cel 3 from the hole 5 which broke on the sheet 4. That is, first, as shown in drawing 4 (a), the end face which stuck the sheet 4 which ended the hole 5 is immersed into the slurry 6 in a container 7. And as shown in drawing 4 (b), a slurry 6 is pressed fit and filled up with pushing ceramic honeycomb Plastic solid 1 using the press means 8 in a cel 3 through the hole 5 of a sheet 4. Then, as shown in drawing 4 (c), the eye closure to an end side is ended by removing a sheet 4 from an end face.

[0013] Then, the same eye closure is carried out also to other end faces, and ceramic honeycomb Plastic solid 1 which filled up the predetermined cel 3 of a both-ends side with the slurry 6 is acquired. The ceramic object of the structure where the closure of the cel was carried out by turns in respect of the both ends of the ceramic honeycomb structure object made into the purpose can be acquired by finally calcinating ceramic honeycomb Plastic solid 1 which filled up the predetermined cel 3 with the slurry 6 in the both-ends side. Such a ceramic object is used as DPF (diesel particulate filter) mainly used in order to remove the graphite of a diesel power plant etc.

[0014] In addition, although hole dawn to the sheet stuck on the end face of a ceramic honeycomb Plastic solid was carried out in the example mentioned above using laser, it can also carry out using the Mt. Tsurugi-like needle set by the cel pitch of one needle or a ceramic honeycomb Plastic solid. Moreover, when a needle is heated in this case, since the hole dawn to a sheet becomes easy, it is desirable.

[0015]

[Effect of the Invention] Since the predetermined hole is used according to this invention, breaking whenever it carries out an eye closure process without a mask using a disposable sheet so that clearly from the above explanation, production of a mask and the set to the ceramic honeycomb structure object of a mask can be lost. Moreover, recognition of a cel location and hole dawn to a sheet can be carried out by the image processing and laser beam machining as an example, and can respond also to automation.

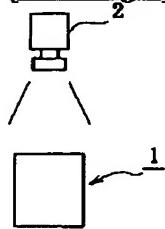
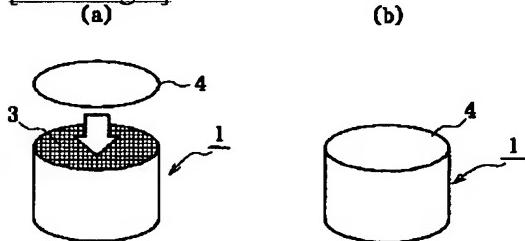
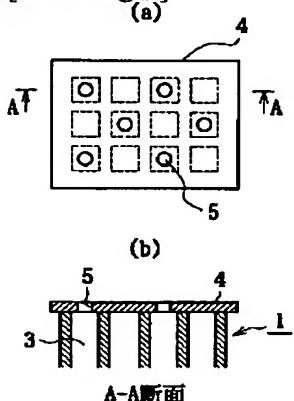
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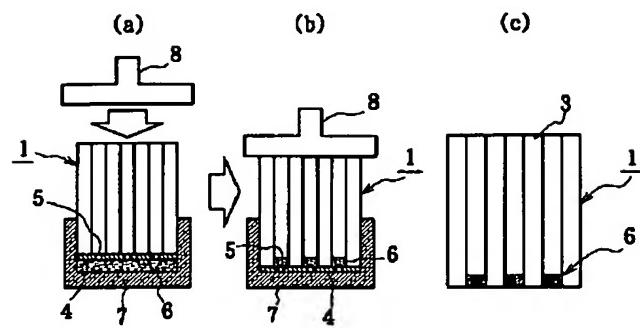
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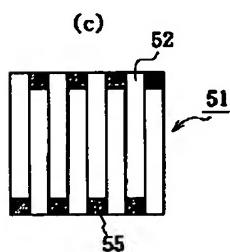
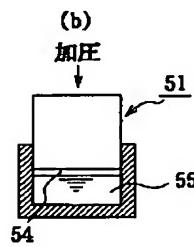
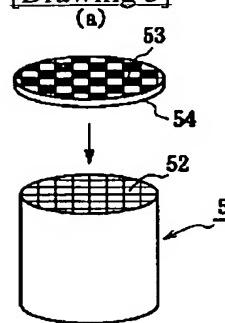
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DRAWINGS

[Drawing 1]**[Drawing 2]****[Drawing 3]****[Drawing 4]**



[Drawing 5]



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